

FOOD AND THE BODY: NUTRITION SCIENCE BASICS



SUMMARY

This lesson teaches students about the nutritional properties of food including water, calories, carbohydrates, protein and fat. By teaching nutritional science basics, we lay the foundation for students to understand what a balanced diet is, the potential effect of eating too many calories, and what information to look for on a nutrition label in order to make healthy choices.

Duration: 90 mins, 2 Sessions | Grade Level: 4th-7th



Module 2: Food and the Body

Nutrition Science Basics

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LESSON RESOURCES

greenbeetz.org

our website hosts lesson slides, google forms, lesson videos, and teacher training videos, glossary, standards alignment and more

Worksheets

- Video Worksheet
- Be a Label Detective!
- Green Light, Yellow Light, Red Light Display

NUTRITION SCIENCE BASICS: AT A GLANCE



ESSENTIAL QUESTION

What comprises a balanced diet and why is it important to eat balanced?



STUDENT LEARNING GOALS AND OBJECTIVES

After this lesson students will be able to:

- Identify the primary groups of nutrients that make up our diet (macronutrients, micronutrients, and fiber).
- Understand the importance of eating a balance of nutrients and drinking enough water.
- Understand how to read and interpret a food label.



KEY POINTS

- **Healthy Cells = Healthy Body** - Our bodies are made up of billions of cells. For our bodies to be healthy, our cells need to be healthy. Every cell needs four things to be healthy: oxygen (from the air we breathe), water, energy (calories), and nutrients. Besides oxygen, everything else we need to be healthy comes from what we eat and drink.
- **Water!** - Water is one of the most important parts of our diet. Water makes up 70% of the human body. It helps deliver nutrients to our cells and remove wastes from the body.
- **Balanced Diet** - In addition to water, a balanced diet is made up of the right mix of energy-containing nutrients, such as carbohydrates, proteins, and fats. Remember, we eat food not nutrients though! Your plate should be $\frac{1}{2}$ vegetables and fruit, $\frac{1}{4}$ protein, and $\frac{1}{4}$ grains and other starchy foods plus water or milk.



VOCABULARY

- **Nutrients** - All food contains nutrients which are categorized as macronutrients (body needs in large amounts) or micronutrients (body needs in small amounts).
- **Calories** - A measure of energy. Calories are the fuel that help our bodies run.
- **Carbohydrates** - an important source of immediate energy; they are made up of sugars and are found in everything from bread to fruits and vegetables to milk.
- **Fiber** - a type of carbohydrate that the body cannot digest.
- **Protein** - provides energy and is found primarily in animal products, dairy, beans, nuts and vegetables (in small amounts).
- **Fat** - is used for long-term energy storage. Healthy fats occur naturally in many foods (e.g., milk, nuts, avocados, and more).
- **Processed foods** - foods that have been changed either by mechanical or chemical means.
- **Ultra-processed foods** - highly processed foods with many added ingredients and additives such as artificial colors and flavors (e.g., frozen meals, soda, packaged cookies and salty snacks.)

LESSON BREAKDOWN

TIME	ACTIVITY	MATERIALS/RESOURCES
PART 1		
3-5 min	Introduction: Turn & Talk	Lesson Slides
3-5 min	Vocab Preview	Lesson Slides
10-15 min	Lesson Video and Discussion	Vimeo or YouTube • Video Worksheets
20 min	Activity: Be a Label Detective	• Examine the Facts Handout • Packaged Food Items/containers
3 min	Food Detective Assessment	Exit Card
PART 2		
3-5 min	Introduction: True or False?	Lesson Slides
15-20 min	Green Light, Yellow Light Red Light Game	Green light, Yellow light, Red Light Google Slides
10 min	Snackz & Factz	Hummus and Veggies
5 min	Test Your Noodle	Slides
5 min	Food Detective Assessment	Exit Card

PRIOR KNOWLEDGE AND MISCONCEPTIONS

PRIOR KNOWLEDGE

Students will likely have a wide range of knowledge about nutrition. Some may know about each macronutrient (proteins, carbohydrates, fats) while others may be unfamiliar with these terms or in which kinds of foods they are plentiful. Students will all come with some understanding of what they think is “good” or “bad” foods both from experiences, previous lessons from Green Beetz, or other programs.

COMMON MISCONCEPTIONS	POSSIBLE RESPONSE
All fats are bad	The building blocks of our bodies are cells, and cell membranes are made of fats. Not only are unsaturated fats good for us, they are necessary. Higher levels of saturated fats and any level of trans-fats in the diet have been associated with greater risk of heart disease and diabetes.
Eating fat will make you fat	The name — fat — may make it sound like something you shouldn't eat. But fat (a macronutrient) is an important part of a healthy diet. Dietary fat helps your body grow and develop. Fats fuel the body and are necessary to absorb certain vitamins. They also are the building blocks of hormones and they insulate nervous system tissue in the body.
All calories are the same, so it doesn't matter what kind of food I eat.	By definition, a calorie is the same no matter what you eat, but the value of a food goes beyond calories. Calories from whole foods provide more value to your body than processed foods.
Carbs are bad	We get approximately 50% of our energy from carbohydrates, our bodies need carbohydrates to move and function. What matters is the kind and amount of carbohydrate we choose to eat frequently vs. sparingly.

DETAILED LESSON SCRIPT: PART I

Introduction: Turn & Talk

3-5 minutes

LESSON SLIDES



With this short open-ended discussion you can get a good understanding of what your students already know about nutrients and get them

primed for today's lesson. Hopefully they will mention key words such as water, nutrients, protein, balanced-diet, etc..

- *What do our bodies need to grow strong?*



Vocabulary Review

5 minutes

Preview the vocabulary by assessing how familiar students are (you can use the thumbs up, thumbs down, or sideways strategy). If most students know a word, you can have students give examples or a definition of each word.

Nutrients

All food contains nutrients. Nutrients are categorized as macronutrients and micronutrients. Different kinds of foods contain different amounts of these nutrients.

- **Macronutrients:** carbohydrates, fat and protein.
- **Micronutrients:** commonly referred to as vitamins and minerals these nutrients are needed in smaller amounts.

Calorie

A calorie is a unit of energy and is the fuel that our bodies run on. If we eat more calories than we burn, the extra calories are converted into body fat, and likely will lead to weight gain.

Carbohydrate

Carbohydrates are an important source of immediate energy (calories); they are made up of sugars and are found in everything from bread, to fruits and vegetables, to milk. There are two types of carbohydrates: complex and simple.

- Simple carbohydrates usually taste sweeter and are less healthy – they are found in white bread, soda, fruit juice.
- Complex carbohydrates contain fiber and are healthier – some examples of complex carbohydrates include oatmeal, whole grain bread, fruit and vegetables.

Vocabulary continues on next page...



Vocabulary (continued)

Fiber	Fiber is a type of carbohydrate that the body cannot digest. Eating a diet high in fiber has huge benefits! It helps to move waste through the body, lowers cholesterol levels, slows the absorption of blood sugar into the bloodstream, encourages healthy gut microbiota and aids in weight maintenance.
Protein	Like carbohydrates, protein also provides energy. It's found primarily in animal products, and dairy, beans, nuts and vegetables (in small amounts). Protein is very important for cell functioning - it helps our bones, muscles, hair and nails grow, and is critical to the health of our immune system and blood.
Fat	Fat is used for long-term energy storage and helps with the functioning of the brain, skin and other organs. It also helps us to absorb and use vitamins. Healthy fats occur naturally in many foods (e.g., milk, nuts, avocados, and more). Generally, these fats are better for us than the fat that is added when food is processed or deep-fried.
Minimally Processed vs. Ultra-Processed Foods	<p>Processed foods are foods that have undergone a mechanical or chemical operation to change or preserve it. Many foods undergo minimal processing. Examples include baby carrots, applesauce and canned tuna fish.</p> <p>Ultra-processed foods typically come in a package, have many ingredients and contain high amounts of unhealthy fats, salt, sugar and empty calories. They may also contain lots of chemicals and preservatives, which don't belong to any natural food group and have known and unknown negative effects on our bodies.</p>

Lesson Video: Nutrition Science Basics

10-15 minutes

DIFFERENTIATION

You should decide which structure will help your students access the information:

- Preview the worksheet as a class
- Have students watch the video and ask questions
- Watch the video more than once, pausing at key moments, etc.
- Or, you can allow their responses to be more open-ended and ask: What surprised you? What was most interesting? What was most important? Why?



Nutritional Science Basics Video Worksheet

Answer the questions before you watch the video. You can jot down your ideas as you watch or wait until

What are the four things every cell needs?	
What is the best way to maintain a healthy diet?	
Water makes up 70% of our body. What do we need it?	

For discussion display or refer to the Key Points as needed.

Some questions to help lead the discussion (or refer to video worksheet):

- What are some takeaways from the video?
- How does our body use protein? How about carbohydrates? Fat?
- Why is water important?
- What information can you gather when reading a food label, what should you avoid?

Key Points

Healthy Cells = Healthy Body

Our bodies are made up of billions of cells. For our bodies to be healthy, our cells need to be healthy. Every cell needs 4 things to be healthy: oxygen (from the air we breathe), water, energy (calories), and nutrients. Besides oxygen, everything else we need to be healthy comes from what we eat and drink.

Hydration

The best way to stay well-hydrated is by drinking water when you are thirsty. Water makes up 70% of the human body. It helps us get nutrients to the cells and helps remove wastes from the body among other necessary functions. Water is one of the most important parts of our diet

Balanced Diet

In addition to water, a balanced diet is made up of the right mix of energy-containing nutrients, such as carbohydrates, protein, and fat. Remember, we eat food not nutrients though! Your plate should be ½ vegetables and fruit, ¼ protein, and ¼ grains and other starchy foods plus water or milk.



Activity: Be a Label Detective - Examine the Facts

20 minutes

Important to share with class before the activity:

Address the idea that families have traditions and recipes they enjoy. The point of this lesson is to make students aware of what they are eating. Humans eat treats all the time and there is nothing wrong with that, but it is important to know that what you are eating is a “treat” so you can balance your other food choices (i.e. if you splurge on mac and cheese one night, maybe have baked potatoes instead of fries the next day).

Be a Label Detective! Examine the facts!
Decoding nutrition facts labels can be confusing, but if you follow the 5 steps below, you'll be a label reading sleuth in no time!

Nutrition Facts	
Serving Size 1 cup (228g) Servings Per Container 2	
Amount Per Serving	
Calories 250	Calories from Fat 110
% Daily Value*	
Total Fat 12g	18%
Saturated Fat 3g	15%
Trans Fat 3g	
Cholesterol 30mg	10%

Use the **Be a label detective!** handout which explains how to read and assess a nutrition facts label, ask students to read through the different sections of a food label from the worksheet.

Ask the students the following:

- What does Serving Size mean?
- Which nutrients should we limit?
- Which nutrients should we try to get more of?
- Do you think it is important to look at food labels? Why or why not?
- What do you wish was included on food labels in addition to what is already there?

Next, print out copies of different nutrition labels (or find them online or bring them from home) and assign each group 2-3 labels to review (they can be the same or different per group).

Ask students to compare the labels. Remind them to look not just at the amount of any nutrients, but also the serving size and ingredients to help them decide which is healthier and why.

Questions for consideration:

- What is similar between the labels?
- What is different?
- Did anything surprise you?
- Which food item seems like it will feed your body’s cells better? Why?

Food Detective Assessment

3 minutes

Have students answer the following on an Exit Card:

- *What do our bodies need to be healthy?* OR • *What are the most important nutrients to look at on a nutrition facts label?*






DETAILED LESSON SCRIPT: PART II




Introduction: True or False?

3-5 minutes

LESSON SLIDES



As I read the following statements, use your thumbs to indicate if you think they are true , false , or unsure 

- People should avoid all fats. 
- People do not need any meat, dairy, beans or nuts. ( - need some source of protein - plant or animal)
- Whole wheat bread is a better choice than white bread. 



Activity: Green Light, Yellow Light, Red Light Game

15-20 minutes

In this activity, students are introduced to green light, yellow light and red light foods. It's important to emphasize that there are no good or bad foods, but some options are better than others. Foods that are high in fiber, protein and other nutrients are better choices than foods that are high in added sugars and saturated or trans fats.



INSTRUCTION

Divide class into groups.

How to play: each round, three foods are presented (one from each category), and teams are asked which food is a green light, yellow light or red light food.

Scoring: Decide if you'll score points for this game and how you want to track each groups answers, i.e. first group to raise their hands, have them write down their answers, take turns, etc... If correct, that team will win the round. If a team can then correctly list the three food items from least to greatest (Red - Yellow - Green) they will get an extra point.

Snackz & Factz

10 minutes

Choose a hummus that has the least amount of processing (little or no added sugar, oils, and preservatives).

Or you can make your own in the classroom! You can try this recipe from [Real Kids Cook Food](#) or use your own favorite hummus or dip recipe.



MATERIALS

- Hummus
- Dipping vegetables
- Pita (*optional*)
- *Optional* - other dip your class enjoys



FACTZ — Students list the factz!

Have students look at the hummus' nutrition label and share their observations. (or if you are making it in the class look at the tahini label or if you have no label to look at talk about how there are no processed foods whatsoever in this snack today!)

- Why do you think this dip and veggie combo was chosen as a healthy snack?

Test Your Noodle

5 minutes

1. Name three of the four main things that our cells need to be healthy.
(oxygen, nutrients, water, energy)
2. Of the foods that were discussed in this lesson, name two that are part of a healthy diet.
3. Of the foods that were discussed in this lesson, name two that should generally be avoided and why?.
4. Fill in the blank: The amount of energy that a food contains is measured in _____. (calories)
5. Name the three macronutrients. (fats, proteins, carbohydrates)
6. Fill in the blank: _____ makes up nearly 70% of our body. (water)

Food Detective Assessment

5 minutes

Have students answer the following on an Exit Card:

These are open-ended questions with no single answer to give you a chance to see what is resonating with your students. You can decide how to use the information (and any misconceptions) to tailor future lessons.

- *What part of the label do you think you will now pay most attention to? Why?*

and/or

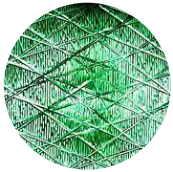
- *What are some changes I can make to make my diet healthier?*



Activity: Green Light, Yellow Light, Red Light Game

WHAT ARE THEY?

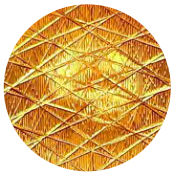
EXAMPLES



Green light foods have the most nutrients and provide your body and brain with the most fuel.

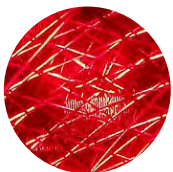
These foods can be eaten any time.

Whole fruits and vegetables, whole grains, beans, nuts and seeds, and plain yogurt.



Yellow light foods have some nutrients, but not as much as green light foods. These foods tend to have more added sugar, saturated fat and empty calories than green light foods. Yellow light foods can be enjoyed sometimes, but not all the time.

Granola and granola bars, dried fruit, and pretzels.



Red light foods provide little to no fuel for your brain and body. These foods are often ultra-processed, fried and/or high in sugar and should be eaten occasionally.

Soda, candy, and fast food...





Activity: Green Light, Yellow Light, Red Light Game

Module 2: Food and the Body
Nutrition Science Basics



Whole wheat bread



Bag of Doritos



Granola bars



1 cupcake



Cup of pretzels



$\frac{1}{2}$ grilled chicken breast



Bacon cheeseburger



Peanut butter



Flavored yogurt



Can of Coke



Dried mango



Cup of milk



Banana



Honey Nut Cheerios



Twix bar

Bonus Round!

whoever raises their hand
and answers first wins!

Of the foods in this game, name:

- 2 foods that are part of a healthy diet
- 2 foods you should avoid

Be a Label Detective! Examine the facts!

Decoding nutrition facts labels can be confusing, but if you follow the 5 steps below, you'll be a label reading sleuth in no time!



Nutrition Facts		
Serving Size 1 cup (228g) Servings Per Container 2		Start here
Amount Per Serving		
Calories 250 Calories from Fat 110		
	% Daily Value*	
Total Fat 12g	18%	Quick guide to % DV
Saturated Fat 3g	15%	5% or less is low 20% or more is high
<i>Trans</i> Fat 3g		
Cholesterol 30mg	10%	
Sodium 470mg	20%	Limit these
Potassium 700mg	20%	
Total Carbohydrate 31g	10%	
Dietary Fiber 0g	0%	Get enough of these
Sugars 5g		
Includes 0g Added Sugars		
Protein 5g		
Vitamin A	4%	
Vitamin C	2%	
Calcium	20%	
Iron	4%	
*Percent Daily Values are based on a 2,000 calorie diet. Your Daily Values may be higher or lower depending on your calorie needs.		
	Calories:	2,000 2,500
Total Fat	Less than	65g 80g
Sat Fat	Less than	20g 25g
Cholesterol	Less than	300mg 300mg
Sodium	Less than	2,400mg 2,400mg
Total Carbohydrate		300g 375g
Dietary Fiber		25g 30g

Decoding nutrition facts labels can be confusing, but if you follow the steps below, you'll be a label reading sleuth in no time!

1. Start here: Serving Size is always located at the top of the label and tells you the amount of food in one portion. The serving size for this can of soup is 1 cup. Serving per Container tell you how many servings there are in the package. In this case, there are two servings, so if you plan to eat the whole can, you must multiply the nutrients by two (i.e., 250 calories x 2 = 500 calories). Sometimes food companies will make their serving size small so the product seems healthier. It's a good idea to look at the number of servings before looking at the rest of the numbers.

2. Quick Guide to % DV: Percent Daily Value is the percentage of a certain nutrient that the food item contains. It is based on a 2,000 calorie diet, which may not be the right amount for everyone. DVs may be higher or lower depending on an individual's calorie needs. Calorie needs are determined by height, weight, age, activity level, genetics and other factors.

When it come to percentages, 5% of or less means it's not a good source of that nutrient. 10-20% mens it's a good source. More than 20% means it's a very good source.

3. Limit These:

Saturated Fat - Fat is a good source of energy and is important for our skin and organs but too much saturated and trans fat can lead to weight gain and health problems.

Sodium - Sodium is another name for salt. Our bodies need sodium in small amounts, but too much can cause health problems. Sodium is added to a lot of foods to add flavor, especially processed and packaged products.

Added Sugar - Look for foods with 5 grams of Added Sugar OR LESS. Added sugars include sugars added during processing from table sugar, syrups, honey, and concentrated fruit or vegetable juices. They do not include naturally occurring sugars that are found in milk, fruit, and vegetables.

4. Get Enough of These:

Fiber - Dietary fiber helps with bowel movements, lowers blood sugar and cholesterol levels, and reduces overall calorie intake. Look for foods with 3 grams OR MORE.

Protein - Protein provides energy and is found in animal products, dairy, beans and vegetables (in small amounts).

Vitamins and Minerals - The bottom of the label lists important vitamins and minerals. Americans generally do not get the recommended amount of vitamin D, calcium, iron and potassium.

5. A Good Rule of Thumb Look for foods that are HIGH in FIBER, PROTEIN, VITAMINS and MINERALS and LOW in SUGAR, SODIUM, CHOLESTEROL and SATURATED and TRANS FATS.

How to Read an Ingredient List:

- Stay away from products with ingredients that you can't pronounce.
- Remember that the main ingredients are listed first. Steer clear of foods where sugars (corn syrup, sugar, sucrose), fats, oils, and salt are among the first few ingredients.
- The fewer ingredients, the better. Choose foods with 5 ingredients or less.

Name: _____

Date: ____

Nutritional Science Basics: Part 2 - Exit Card

What part of the label do you think you will now pay most attention to? Why?

Name: _____

Date: ____

Nutritional Science Basics: Part 2 - Exit Card

What part of the label do you think you will now pay most attention to? Why?

Name: _____

Date: _____

Nutritional Science Basics Video Worksheet

Read the questions before you watch the video. You can jot down your ideas as you watch or wait until the end.

1. What are the four things every cell needs?	
2. What is the best way to maintain a healthy diet?	
3. What makes up 70% of our body? Why do we need it?	
4. What are the three main nutrients in cells?	
5. Why do we need carbohydrates?	
6. What is the difference between complex and simple carbohydrates?	
7. Why do we need protein? Where do we get it?	
8. Where can you find healthy fats? Why do we need some fats?	
9. What are calories? What happens if we consume more calories than we burn off in a day?	
10. When we read a nutrition label, what information can we gather from it? What should we avoid?	

Answers for 5.1

<p>1. What are the four things every cell needs?</p>	<p>Energy, nutrient, oxygen, and water.</p>
<p>2. What is the best way to maintain a healthy diet?</p>	<p>Eating right; avoiding “junk”.</p>
<p>3. What makes up 70% of our body? Why do we need it?</p>	<p>Water.</p> <ul style="list-style-type: none"> • Helps pass nutrients on to cells • Helps bodily waste to be expelled
<p>4. What are the three main nutrients in cells?</p>	<p>Protein, carbohydrates, and fats.</p>
<p>5. Why do we need carbohydrates?</p>	<p>They give our bodies immediate energy.</p>
<p>6. What is the difference between complex and simple carbohydrates?</p>	<p>Simple carbs are not as good; found in sweets and don't give us lasting energy. Complex carbs are better because they provide us with energy and can be found in oatmeal, whole grains, and vegetables.</p>
<p>7. Why do we need protein? Where do we get it?</p>	<p>Protein helps our cells function properly and helps us grow muscle, bone, and hair. Main sources are meats, dairy, nuts, and beans.</p>
<p>8. Where can you find healthy fats? Why do we need some fats?</p>	<p>Avocado, milk, and nuts. Fats store energy long term and help the brain and skin stay healthy.</p>
<p>9. What are calories? What happens if we consume more calories than we burn off in a day?</p>	<p>Calories are the measure of energy that cells contain-- the body's fuel. They turn into body fat/extra weight if we consume more than we burn.</p>
<p>10. When we read a nutrition label, what information can we gather from it? What should we avoid?</p>	<p>Labels allow us to ensure that the foods we eat are safe. They list all the ingredients in the product, which is important for people with allergies. We also can learn the proper serving size and what nutrients are contained and in what percentage from food labels.</p> <p><u>Avoid:</u></p> <ul style="list-style-type: none"> • Artificial • High caloric • Fat Content: saturated fats, trans-fat/ hydrogenated fats.